

CLAIMS

The embodiment of the invention in which an exclusive property or privilege is claimed is defined as follows:

1. A method for manipulating genetic material, the method comprising:
 - a) disrupting cells so as to liberate genetic material contained in the cells;
 - b) contacting the genetic material to a column in a manner to cause the genetic material to become immobilized to the column;
 - c) labeling the immobilized genetic material; and
 - d) eluting the labeled material from the column.
2. The method as recited in 1 wherein the step of labeling the genetic material further comprises maintaining the column at a temperature of between 45 °C and 100 °C.
3. The method as recited in claim 1 wherein the column comprises a means for subjecting the silica to pressure.
4. The method as recited in claim 3 wherein the pressure means is a syringe.

1 5. The method as recited in claim 1 wherein the step of labeling
2 the genetic material comprises:

3 a) contacting double-stranded nucleic acid molecules of the genetic
4 material with radical-generating complexes for a time and at concentrations sufficient to
5 produce free-aldehyde moieties;

6 b) reacting the aldehyde moieties with amine to produce a condensation
7 product; and

8 c) contacting the condensation product with a chromophore.

1 6. The method as recited in claim 5 wherein the step of contacting the
2 condensation product with a chromophore further comprises reducing the condensation
3 product and cross-linking the reduced condensation product with the chromophore in
4 one reaction step.

1 7. The method as recited in claim 1 wherein the column is a solid substrate
2 selected from the group consisting of silica, ground glass filter, pulped glass filter,
3 HNO₃-washed glass filter pulp, HNO₃-washed gel, HNO₃-washed diatoms, silicic acid
4 400 mesh silica gel, SPE-SIL and combinations thereof.

1 8. A two-buffer process for manipulating genetic material, the process
2 comprising:

3 a) contacting cells containing the genetic material to a silica column;
4 b) creating a first fraction of cell detritus and a second fraction containing the
5 genetic material;

6 c) confining the genetic material to the column;

7 d) removing the cell detritus;

8 e) subjecting the genetic material to radicals so as to produce reactive
9 aldehyde groups on the genetic material; and

10 f) attaching chromophore to the genetic material.

1 9. The process as recited in claim 8 wherein the genetic material is
2 contacted with radical in aerobic conditions.

1 10. The process as recited in claim 8 wherein the genetic material is con-
2 tacted with radical in anaerobic conditions.

1 11. The process as recited in claim 8 wherein the step of creating a
2 fraction of cell detritus and the genetic material comprises contacting the cells with a
3 lysis buffer.

1 12. The process as recited in claim 8 wherein steps a) through f) occur in
2 approximately 20 minutes.

1 13. The process as recited in claim 8 wherein the two buffers comprise a first
2 buffer to lyse the cells and a second buffer to attach the genetic material to the column.

1 14. The process as recited in claim 13 wherein the first buffer and second
2 buffer contain guanidine thyocianate and EDTA.

1 15. The process as recited in claim 13 wherein the first buffer and the second
2 buffer contact the cells simultaneously.

1 16. The process as recited in claim 8 wherein the genetic material is
2 bound to chromophore in aerobic conditions.

1 17. The process as recited in claim 8 wherein the genetic material is bound to
2 chromophore in anaerobic conditions.

1 18. The process as recited in claim 13 wherein the first buffer and the second
2 buffer are present in a relative weight ratio of 9:4.

1 19. The process as recited in claim 8 wherein the temperature is maintained
2 at 95 °C.